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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/933,684	08/20/2001	William Chun	06816-073003	7123

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EXAMINER

MUSSER, BARBARA J

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/933,684

Applicant(s)

CHUN ET AL.

Examiner

Barbara J. Musser

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 6, 7, 12, and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear what is meant by a NAFION solution. Applicant is advised that the compositions of tradenames change over time. As such applicant is required to use generic terminology for the tradename. It is unclear what is meant by PTFE-30 as PTFE is a known polymer, but it is unclear what the -30 means. Abbreviations should not be used in claims as they can have multiple meanings which are dependent on the specific field.

Claims 6, 7, 12, and 13 contain the trademark/trade name NAFION and PTFE-30. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade

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names are used to identify/describe a perfluorovinylether sulfonic acid and a polytetrafluoroethylene suspension and, accordingly, the identification/description is indefinite.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 8, 9, and 16 are rejected under 35 U.S.C. 103(a) as being obvious over Harada(U.S Patent 5,399,184) in view of Prakash et al.(U.S. Patent 6,444,343).

Harada discloses forming a membrane electrode assembly by depositing a catalyst directly on both sides of a membrane.(Col. 3, ll. 61-64; Col. 7, ll. 67-69) The membrane is then stacked with conventional carbon sheets to form a fuel cell.(Col. 9, ll. 8-10) They are bonded via hot pressing.(Col. 10, ll. 22-31) The catalyst can contain platinum.(Col. 6, ll. 45-46)

The reference does not disclose swelling the membrane prior to applying the catalyst. Prakash et al. discloses swelling a membrane used in fuel cells prior to applying the catalyst since such swelling improves the interfacial contact of the membrane reducing the amount of catalyst needed.(Col. 12, ll. 22-35) It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a swelled membrane by treating the membrane with a swelling agent since such

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swelling improves the interfacial contact of the membrane reducing the amount of catalyst needed.(Col. 12, ll. 22-35)

Regarding claim 16, Harada discloses the catalyst load is $0.04\text{--}4.0\text{ mg/cm}^2$.(Col. 8, ll. 17-18)

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being obvious over Debe et al.(U.S. Patent 5,910,378) in view of Prakash et al.

Debe et al. discloses forming a membrane electrode assembly by depositing a catalyst directly on both sides of a membrane and applying a support.(Col. 1, ll. 39-48; Col. 18, ll. 55-560) The layers the then laminated together.(Col. 18, ll. 65-67) The catalyst can contain platinum.(Col. 6, ll. 12-14)

The reference does not disclose swelling the membrane prior to applying the catalyst. Prakash et al. discloses swelling a membrane used in fuel cells prior to applying the catalyst since such swelling improves the interfacial contact of the membrane reducing the amount of catalyst needed.(Col. 12, ll. 22-35) It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a swelled membrane by treating the membrane with a swelling agent since such swelling improves the interfacial contact of the membrane reducing the amount of catalyst needed.(Col. 12, ll. 22-35)

6. Claims 3, 8, and 9 are rejected under 35 U.S.C. 103(a) as obvious over Cisar et al.(U.S Patent 6,054,228) in view of Prakash et al.

Cisar et al. discloses forming a membrane electrode assembly by depositing a catalyst directly on both sides of a membrane to form thin film electrodes and applying a

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carbon paper support.(Col. 7, ll. 42-43, 53-59; Col. 8, ll. 22-25) While the reference does not explicitly state the carbon paper is bonded to the membrane, one in the art reading the reference as a whole would see that the support was hot pressed to the membrane(Col. 7, ll. 54) and that such hot pressing is intended to bond the layers together. The catalyst can contain platinum.(Col. 8, ll. 22-24)

The reference does not disclose swelling the membrane prior to applying the catalyst. Prakash et al. discloses swelling a membrane used in fuel cells prior to applying the catalyst since such swelling improves the interfacial contact of the membrane reducing the amount of catalyst needed.(Col. 12, ll. 22-35) It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a swelled membrane by treating the membrane with a swelling agent since such swelling improves the interfacial contact of the membrane reducing the amount of catalyst needed.(Col. 12, ll. 22-35) It is noted that the effective date of this reference is considered to be September 10, 1997.

Alternatively, it would have been obvious to one of ordinary skill in the art at the time the invention was made to bond the carbon paper support to the membrane electrode assembly since it is well-known in the fuel cell art to bond the layers intimately together as otherwise the support will not provide support for the entire catalyst layer and since Cisar et al. suggests all the layers are bonded together in some fashion.(Col. 8, ll. 40-44)

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7. Claims 4, 5, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Debe et al. and Prakash et al. as applied to claim 3 above, and further in view of Grot(U.S Patent 5,547,911).

The references cited above do not disclose how the catalyst ink is applied to the membrane. Grot discloses catalysts can be applied in a variety of ways including pouring and spraying the ink on the membrane.(Col. 6, ll. 65- Col. 7, ll. 1) It would have been obvious to one of ordinary skill in the art at the time the invention was made to pour or spray the catalyst ink onto the membrane since Debe et al. is silent as to the method of application and since Grot discloses these are well-known methods of applying catalyst to membranes.

8. Claims 6, 7, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Debe et al., Prakash et al., and Grot as applied to claims 4, 5, 10, and 11 above, and further in view of Narayanam et al.(U.S. Patent 5,945,231).

The references cited above do not disclose the catalyst ink composition as having 7-10% catalyst, 60-70% NAFION solution, and 20-30% PTFE-30 diluted to 11% solids. Grot discloses ink compositions are well-known and discloses a conventional one, with disclosing all the specific percentages.(Col. 4, ll. 48-49) Narayanam et al. discloses a catalyst ink which is used in making fuel cells wherein the ink contains 150 mg catalyst, 60-70% NAFION solution, and 15-20% PTFE-30 diluted to 11% solids.(Col. 4, ll. 1-5) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the catalyst ink composition of Narayanam et al. since Grot

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discloses any conventional ink composition may be used and since the ink of Narayanam et al. appears to be conventional.

9. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Debe et al. and Prakash et al. as applied to claim 3 above, and further in view of Narayanam et al.(U.S. Patent 5,945,231).

The references cited above do not disclose the solvent the membrane is swollen in. Narayanam et al. discloses soaking a membrane in a mixture of iso-propanol and water with about 90% water to swell the membrane so that it better accepts the catalyst layer.(Col. 4, ll. 54-56) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use about 90% water and 10% iso-propanol since Narayanam et al. discloses this proportion can swell the membrane to a desired degree such that a catalyst layer can be transferred to it(Col. 4, ll. 52-58) and since Prakash et al. is silent as to the material used to swell the membrane.

Response to Arguments

10. Applicant's arguments filed 1/9/04 have been fully considered but they are not persuasive.

Regarding applicant's argument that the art does not teach the step of pre-swelling the membrane, Prakash et al. discloses that pre-swelling the membrane improves the interfacial contact of the membrane reducing the amount of catalyst needed. (Col. 12, ll. 22-35) It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a swelled membrane by treating the

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membrane with a swelling agent since such swelling improves the interfacial contact of the membrane reducing the amount of catalyst needed.(Col. 12, ll. 22-35)

Regarding applicant's argument that catalyst loading is extremely important in the invention and that Grot teaches away from this, Grot is simply used to show a conventional catalyst ink. Additionally, applicant has not indicated that certain ranges were critical. Harada discloses applicant's range. Finally, while Grot may teach that the amount of catalyst is not critical, one in the art would desire to decrease the amount of platinum used whenever possible due to its high price.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Barbara J. Musser** whose telephone number is **(571) 272-1222**. The examiner can normally be reached on Monday-Thursday; alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571)-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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